

Effect of Caffeine on the Growth of *Streptococcus mutans*

Aubrey E. DuBois¹, Richard L. Gregory²

¹Department of Biology, Purdue University School of Science; ²Department of Oral Biology, Indiana University School of Dentistry

Caffeine consumption is a staple of the typical adult diet. Previous research has demonstrated many possible health benefits of regular consumption of caffeine-containing beverages such as coffee and tea. Coffee may contain up to 200 mg caffeine/cup (84 µg/ml). This study investigated the correlation between oral health and caffeine consumption by observing the effects of the compound on the growth of a leading contributor to tooth decay, *Streptococcus mutans*. Assays were performed to examine the effect of different concentrations of caffeine on both the planktonic and biofilm growth of the bacteria. Caffeine concentrations of 200 and 400 µg/ml demonstrated significant biofilm formation enhancement ($p < 0.05$). Contrastingly, concentrations from 31.25 through 100 µg/ml caused a slight, significant inhibition in biofilm formation. Planktonic growth of *S. mutans* was marginally inhibited in concentrations of 31.25 through 200 µg/ml. The results of this study indicate a potential for adverse side effects to oral health when caffeine is consumed in high concentrations. Lower concentrations such as those naturally found in coffee and tea may inhibit formation of biofilm and dental plaque, thereby promoting good oral health.

Mentor: Richard L. Gregory, Department of Oral Biology, Indiana University School of Dentistry, Indianapolis, IN